

DEPARTMENT OF TRANSPORTATION**DIVISION OF ENGINEERING SERVICES**

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-017524**Date Inspected:** 21-Oct-2010**Project Name:** SAS Superstructure**OSM Arrival Time:** 1000**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1830**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** See Below**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Orthotropic Box Girders**Summary of Items Observed:**

At the start of the shift the Quality Assurance Inspector (QAI) traveled to the project site and observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the locations noted below:

- A). Field Splice E7/E8
- B). "A" Deck Longitudinal Stiffeners
- C). Ventilation Access Hole-Insert Plate

A). Field Splice E7/E8

The QAI observed the excavations of the unacceptable discontinuities on the deck plate field splice identified as WN: 6E-7E-B1, repair cycle # 1, and the rejects were identified as Flaw #1, # 2, # 3, # 5, # 8, # 9 and # 10. The rejectable discontinuities were discovered during the Ultrasonic Testing (UT) performed by the QC technician, Jesse Cayabyab and appeared to travel in the longitudinal direction of the weld axis. The excavations was performed by welding personnel Fred Kaddu ID-2188 utilizing a high cycle grinder to remove the defects and a rotary file to bring the excavated area into compliance with the Weld Procedure Specification (WPS) ABF-WPS-D15-1001 Repair, Rev. 0. At the conclusion of the excavations the QC inspector, Mr. Cayabyab, performed a visual inspection and a Magnetic Particle Test (MPT) of the areas and no rejectable indications were noted. At this time the welder commenced the repair welding utilizing the Shielded Metal Arc Welding (SMAW) process as per the WPS which was also utilized by the QC inspector to monitor the welding and to verify the DC welding parameters. The QC inspector verified the DC welding parameters as 123 amps and the minimum preheat temperature 40 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius which appeared to

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comply with the contract documents. The 3.2 mm electrode was utilized with the welding performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical. Prior to the welding the QAI verified the dimensions of the excavations and were noted and recorded as follows; Flaw # 1, Y=40 mm, L=140 mm and d=12 mm; Flaw #2, Y=200 mm, L=165 mm and d=17 mm; Flaw # 3, Y=310, L=100 mm and d=12 mm; Flaw # 5, Y=500 mm, L=100 mm, d=12 mm, Flaw # 8; Y=660 mm, L=110 mm, d=12mm and Flaw # 9, Y=1150 mm, L=100 mm and d=8mm and Flaw # 10, Y=1220 mm, L=120 mm and d=12 mm. The repair welding, excavations and the QC inspection was not completed during this shift.

B). "A" Deck Longitudinal Stiffeners

The QAI observed the welder, Xiao Jian Wan ID-9677, perform the CJP groove welding on the longitudinal stiffener field splice identified as WN: 2E-PP17.5-E2-LS-West, located at the ventilation access hole. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector John Pagliero as a reference to monitor welding and verify the DC welding parameters. The amperage was recorded as 125 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was observed and verified. The CJP welding performed by the welder was completed during this scheduled shift.

The QAI also observed the welder, Hua Qiang Hwang ID-2930, performed the CJP groove welding on the longitudinal stiffener field splice identified as WN: 1E-PP10.5-E5-LS-East. The welder utilized the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and was also utilized by the QC inspector John Pagliero as a reference to monitor the welding and verify the DC welding parameters. The amperage was recorded as 123 amps and the minimum preheat of 100 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified. The CJP welding of the "B" face was completed during this scheduled shift.

The welding of the longitudinal stiffeners was performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical. The welder utilized a slag hammer, pneumatic air gun with an attached chisel and a wire wheel attached to a 4" high cycle grinder to remove slag after deposit of each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from sealed containers. The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents. At the time of the observation no issues were noted by the QAI.

The QAI also observed that the preheat temperatures were achieved and maintained utilizing the induction heating system during the welding operation. The heat induction heating process was controlled by utilizing a Miller Preheat Unit and were located at each welding station.

C). Ventilation Access Hole-Insert Plate

The QAI observed the Complete Joint Penetration (CJP) welding of the ventilation access hole, insert plate, identified as WN: 3E-PP23.5-E2-SE. The welding was performed by, Wai Kitlai ID-2953, utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1010, Rev. 0. The WPS was also utilized by the QC inspector William Sherwood as a reference

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to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 191 amps by the QC inspector. The 4.0 mm electrode was utilized with the welding performed in the flat (1G) position with the work in an approximately horizontal plane and the weld metal deposited from the upper side. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector. The CJP welding was not completed on this date.

D). Erection Access Hole-Insert Plate

The QAI observed the Complete Joint Penetration (CJP) of the erection access hole insert plate identified as Weld Number (WN): 2E-PP15-E4-W2 on the "A" deck of the Orthotropic Box Girder (OBG) E1. The welding was performed by Darcel Jackson ID-9967 utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1050A, Rev. 1. The WPS was also utilized by the QC inspector Mike Johnson as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 210 amps by the QC inspector. The 4.0 mm electrode was utilized with the welding performed in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector.

Later in the shift the QAI observed the welder, Mr. Jackson, performing CJP welding of the insert plate identified as WN: 1E-PP9.5-E3-W1. It appeared the CJP welding was performed utilizing the WPS as noted in the above paragraph and was also utilized by the QC inspector as a reference to monitor the welding and to verify the welding parameters.

The QAI also observed the Complete Joint Penetration (CJP) of the erection access hole insert plate identified as Weld Number (WN): 2E-PP15-E3-W4. The welding was performed by Eric Sparks ID-3040 utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1050A, Rev. 1. The WPS was also utilized by the QC inspector as a reference to monitor the welding and verify the Direct Current Electrode Positive (DCEP) welding parameters which was recorded as 135 amps by the QC inspector. The 3.2 mm electrode was utilized during the welding of the root pass which was performed in the flat (1G) position with the work placed in an approximately horizontal plane and the weld metal deposited from the upper side. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius were verified by the QC inspector.

In regards to the erection access holes the contractor has elected to utilize a copper plate as a backing material during the welding of the root pass on the Complete Joint Penetration groove welding of the insert plate to the deck plate.

QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding of the field splices utilizing the WPS as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified by the QC inspector and utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The ESAB consumables utilized for the SMAW welding process appeared to comply with the AWS Specification and AWS Classification. The QC

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inspection, testing and welding performed on this shift appeared to be in general compliance with the contract documents. At random intervals, the QAI verified the QC inspection, testing, welding parameters and the surface temperatures utilizing various inspection equipment and gages which included a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

The digital photographs below illustrate the work observed during this scheduled shift.



Summary of Conversations:

There were general conversations with Quality Control Inspector Bonifacio Daquinag, Jr. at the start of the shift regarding the location of American Bridge/Fluor welding, inspection and N.D.E. testing personnel scheduled for this shift.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mohammad Fatemi (916) 813-3677, who represents the Office of Structural Materials for your project.

Inspected By: Reyes,Danny

Quality Assurance Inspector

Reviewed By: Levell,Bill

QA Reviewer